

# ***BIOTIC COMMUNITIES***

## **Fish Community Data**

Fifty-one species of fish, representing 15 families, have been collected from the Platte River basin since 1941, and of these, five were identified from angler creel records (Table 16). Distribution maps from Pflieger (1975) indicate that the ranges of 23 additional species include parts of the basin, although none of these species have been collected within the basin. Four species of fish were only collected prior to 1905, and they include common shiner (*Notropis cornutus*), Topeka shiner (*N. topeka*), hornyhead chub (*Nocomis biguttatus*), and johnny darter (*Etheostoma nigrum*). These four species were each collected at separate single locations and have not been sampled since their initial collection which suggests they have been extirpated from the basin (Pflieger 1975). Locations of recent and historical fish collection sites are shown in Figure 15 and Table 17 gives a summary of the fish and habitat sample sites from the recent MDC collections.

Eighteen sites were recently sampled by MDC personnel throughout the basin during 1995 and 1996 (Table 17, Figure 15), and these samples (excluding Location # 1378 which was affected by Smithville Lake) are the basis for the following comparisons. The most common group of fishes (by number) collected based on geographical distribution patterns of Pflieger (1971) were those classified as wide ranging, and these accounted for 42.2% of all fish collected. Six other faunal groups were represented and are ranked as follows: big river (20.1%), prairie (20.0%), Ozark prairie (6.7%), Ozark (4.4%), lowland (4.4%), and Ozark lowland (2.2%). Dominant families included Cyprinidae (minnows; 16 species), Catostomidae (suckers; seven species), Ictaluridae (catfish; six species), and Centrarchidae (sunfish; seven species).

Red shiner was the most abundant species overall, and was also the most common nektonic, mid-water, species collected. They accounted for 67.1% of the fish collected in the recent samples, and they were found at all of the sites. The second most common nektonic species was sand shiner, and they accounted for 11.2% of the overall sample. Other common nektonic species in order of abundance were bigmouth shiner, central stoneroller, creek chub, and flathead minnow. The most commonly collected large fish was green sunfish, accounting for 2.9% of the recent sample. Other common large species in order of abundance were channel catfish, bluegill, yellow bullhead, common carp, largemouth bass, and river carpsucker. Benthic species were the most lacking group in terms of diversity and numbers within the basin. However, this is somewhat common for this type of system. The suckermouth minnow was the most abundant benthic species sampled, comprising 96.0% of the benthic sample and accounting for 1.2% of the overall sample. The only other representatives in this category were three stonecat, and one tadpole madtom. The collection of the tadpole madtom indicates an extension of its described range (Pflieger 1971, 1975).

Channel catfish and flathead catfish are two of the most popular sportfish within the basin. All reaches of the Platte River and its tributaries offer good catfishing opportunities, but the best fishing is found in the lower unchannelized reaches of the Platte River. Common carp and bullheads also provide angling opportunities throughout the basin, while white bass and crappie

provide seasonal opportunities. The Missouri state record grass carp was taken from the Platte River near MDC's Saxton Access in 1992, and it weighed 55 pounds and 12 ounces.

A detailed study comparing fish populations in channelized versus unchannelized portions of the Platte River was conducted by Michaelson (1971). Results from the study indicated that an inverse relationship existed between abundance of fish and amount of stream channelization. The study found that average standing crop of fish at two unchannelized sites was 691.5 pounds per acre compared to 103.0 pounds per acre at two channelized sites. This represented an 85% reduction of fish from unchannelized to channelized sites. The study also showed a 77% reduction in number of harvestable size (> 10 inches) fish per acre and a 90% reduction in pounds of harvestable fish per acre in the channelized sites compared to unchannelized sites. An estimate of the amount of fish that would be lost if the remaining 56 miles of unchannelized Platte River (from Agency to the Missouri River) were channelized was also formulated. It was estimated that about 130,000 pounds (86%) of all fish and 131,000 pounds (91%) of harvestable sized fish would be lost (note - the loss of harvestable-sized fish is greater than the loss of the total fish population because channelized sections contain disproportionately fewer numbers of harvestable-sized fish). Currently, the Platte River from Agency to its mouth remains unchannelized, and it is probably one of the best remaining sections of fishable river left in the basin.

### **Aquatic Invertebrates**

**A. Mussels-** A 1913 survey of the northern Missouri rivers found that the Platte River and its tributaries held a considerable number of mussels of commercial value, and the resource was in demand due to mussel depletions from the Missouri and Mississippi rivers (Campbell 1914). The mussel resources in the Platte River basin were soon depleted (Oesch 1984), but recent sampling of streams in northern Missouri has found mussels that were once thought to be eliminated (S. Bruenderman, MDC, personal communication). Chemicals related to agriculture and high rates of sedimentation have also been detrimental to mussels within the basin. Oesch (1984) indicated that 16 species of freshwater mussels historically occurred in the Platte River basin (Table 18).

**B. Aquatic Insects-** A detailed survey of benthic macroinvertebrates was conducted in 1974 and 1976 on the Little Platte River (river mile 34) prior to impoundment of Smithville Lake (USCOE 1981). The 1974 sample was conducted at a riffle just downstream from the Plattsburg sewage treatment plant and an area landfill. Samples collected from the site indicated a fairly diverse community, but one with limited density. The low density was attributed to runoff from the two upstream pollution sources. The site was resurveyed in 1976, and diversity was comparable between the two years (19 taxa collected each year). Benthic density substantially increased from 3,391 organisms/meter<sup>2</sup> in 1974 to 16,454 organisms/meter<sup>2</sup> in 1976. The 1976 sample was dominated by species that were tolerant of low dissolved oxygen and pollution. This was not true of the 1974 sample. The high density of pollution tolerant species combined with the chemical nature of the water gave evidence that the two sources were contributing organic pollution to the stream.

Pool habitats within the Little Platte River were sampled in 1976. Benthic densities in pools in the lower and middle reaches were lower than benthic densities in pools of upper stream reaches. The upper pools also contained more pollution intolerant species. Community diversity in pool habitats was lower than those in the riffle situations, which would be expected.

Macroinvertebrates were also collected in Camp Branch and Crows Creek, both tributaries of the Little Platte River. Benthic densities at each of these sites were similar to those found on the mainstem, but community diversity was higher, with several pollution intolerant taxa present (USCOE 1981). The increased macroinvertebrate diversity in tributary streams may be attributed to the more diverse stream habitat along with improved water quality. Silt deposition and loss of habitat due to extensive channelization seem to be major limiting factors in this region along with marginal dissolved oxygen levels and increased nutrient loads.

**C. Crayfish-** Few species of crayfish are known to occur in the northern prairie region of Missouri, which includes the Platte River basin. Only three of the seven different species thought to occur within the basin have been collected. The northern crayfish (*Orconectes virilis*) is the most abundant crayfish found in the basin, followed by the papershell crayfish (*O. immunis*) and the prairie crayfish (*Procambarus gracilis*), respectively. The devil crayfish (*Cambarus diogenes*) has not been collected in the basin but may occur undetected because of its habit of spending most of its life underground and its general distribution throughout the region (Pflieger 1996).

### Threatened and Endangered Species

Topeka shiners were collected in the 102 River near Maryville, MO and Bedford, IA prior to 1905, which suggests a former, more widespread distribution than more recent sampling has indicated. The species has not been collected in the basin since 1905 (Pflieger 1975). The flathead chub (*Platygobio gracilis*) is a fish associated with the Missouri and Mississippi rivers and enter tributary streams only in extreme northwest Missouri. In smaller streams, the flathead chub prefers pools with moderately clear waters, little current, and bottoms composed of coarse gravel and bedrock. The only documentation within the basin was based on one individual collected in the Platte River near St. Joseph in 1941 (Pflieger 1975). The rock-pocketbook mussel (*Arcidens confragosus*) was collected at one location in the Platte River prior to 1920 and is probably extirpated from the basin (Oesch 1984). Other species that are listed as either threatened or endangered that may occur within the basin are listed in Table 19.

### Fish Stockings

Numerous stockings of fish, both native and non-native, have occurred within the basin. The majority of stockings have occurred in private and public lakes and ponds. The most widely stocked fish within the basin is channel catfish. Stocked fish undoubtedly escape, but negative impacts have not been documented within the basin.

Spotted bass (*Micropterus punctulatus*) were stocked in the Platte River at six different sites in 1970 and 1971. A total of 24,000 one to three inch fish was stocked over the two-year period. Since this time, no spotted bass have been collected within the basin. The status of spotted bass is not known at this time, but it is unlikely they are present based on lack of sampling evidence

and their intolerance for water conditions which exist basin wide. Based on follow-up samples of stockings from similar systems it is likely that if a population does exist within the basin it would be in smaller more undisturbed tributary streams (Fajen 1975). A list of species from documented stockings and their locations can be found in Table 20 .

### **Creel Survey Data**

A recreational use survey on the unchannelized portion of the Platte River, from Agency to the confluence with the Missouri River, was conducted by Fleener (1971). Results of the study were considered conservative because surveys were only conducted on public lands and no attempt was made to survey private accesses. The study showed that fishing accounted for 49,500 (51%) of the total trips and 253,315 (73%) of the total hours. Other significant activities included hunting, sightseeing, picnicking, and camping. About 36,000 fish were harvested over this period with 19,500 of them being channel or flathead catfish, and this represented 54% of the total harvest (Table 21) .

### **Present Regulations**

Statewide creel and fish size limits apply to the streams within the basin. One special regulation area does apply: fish may only be taken by pole and line (as defined in the Wildlife Code of Missouri) on the Little Platte River between Smithville Dam and U.S. Highway 169. In addition, special regulations may apply to other public impoundments within the basin.

**Table 16. Fish species sampled in the Platte River basin from 1941-1996.**

<b>Common Name</b>	<b>Scientific Name</b>	<b>Collected 1941-57</b>	<b>Collected 1958-79</b>	<b>Collected 1980-96</b>
<b>American eel*</b>	<i>Anguilla rostrata</i>		X	
<b>Paddlefish</b>	<i>Polyodon spathula</i>	X	X	X
<b>Northern pike*</b>	<i>Esox lucius</i>		X	
<b>Longnose gar</b>	<i>Lepisosteus osseus</i>	X	X	
<b>Shortnose gar</b>	<i>Lepisosteus platostomus</i>	X	X	X
<b>Goldeye</b>	<i>Hiodon alosoides</i>	X	X	X
<b>Gizzard shad</b>	<i>Dorosoma cepedianum</i>	X	X	X
<b>Skipjack herring</b>	<i>Alosa chrysochloris</i>			X
<b>Mosquitofish</b>	<i>Gambusia affinis</i>		X	X
<b>Brook silverside</b>	<i>Labidesthes sicculus</i>			X
<b>Bigmouth shiner</b>	<i>Notropis dorsalis</i>	X	X	X
<b>Sand shiner</b>	<i>Notropis stramineus</i>	X	X	X
<b>Emerald shiner</b>	<i>Notropis atherinoides</i>	X		X
<b>Red shiner</b>	<i>Cyprinella lutrensis</i>	X	X	X
<b>Fathead minnow</b>	<i>Pimephales promelas</i>	X	X	X
<b>Bluntnose minnow</b>	<i>Pimephales notatus</i>		X	
<b>Central stoneroller</b>	<i>Camptostoma anomalum</i>	X	X	X
<b>Common carp</b>	<i>Cyprinus carpio</i>	X	X	X
<b>Grass carp *</b>	<i>Ctenopharyngodon idella</i>			X
<b>Bighead carp*</b>	<i>Hypophthalmichthys nobilis</i>			X
<b>Plains minnow</b>	<i>Hybognathus placitus</i>	X		
<b>Western silvery minnow</b>	<i>Hybognathus argyritis</i>	X		
<b>Creek chub</b>	<i>Semotilus atromaculatus</i>	X	X	X
<b>Golden shiner</b>	<i>Notemigonus crysoleucas</i>		X	X
<b>Redfin shiner</b>	<i>Lythrurus umbratilis</i>	X		X
<b>Suckermouth minnow</b>	<i>Phenacobius mirabilis</i>	X	X	X

Table 16, continued.

Common Name	Scientific Name	Collected 1941-57	Collected 1958-79	Collected 1980-96
Flathead chub	<i>Platygobio gracilis</i>	X		
Bigmouth buffalo	<i>Ictiobus cyprinellus</i>	X	X	X
Smallmouth buffalo	<i>Ictiobus bubalus</i>	X		X
Quillback	<i>Carpionodes cyprinus</i>		X	X
River carpsucker	<i>Carpionodes carpio</i>	X	X	X
Shorthead redhorse	<i>Moxostoma macrolepidotum</i>			X
White sucker	<i>Catostomus commersoni</i>			X
Blue Sucker*	<i>Cycleptus elongatus</i>			X
White bass	<i>Morone chrysops</i>		X	X
Black bullhead	<i>Ameiurus melas</i>	X	X	X
Yellow bullhead	<i>Ameiurus natalis</i>	X	X	X
Stonecat	<i>Noturus flavus</i>	X	X	X
Tadpole madtom	<i>Noturus gyrinus</i>			X
Channel catfish	<i>Ictalurus punctatus</i>	X	X	X
Flathead catfish	<i>Pylodictis olivaris</i>	X	X	X
Green sunfish	<i>Lepomis cyanellus</i>	X	X	X
Bluegill	<i>Lepomis macrochirus</i>		X	X
Orangespotted sunfish	<i>Lepomis humilis</i>	X	X	X
Redear sunfish	<i>Lepomis microlophus</i>			X
Largemouth bass	<i>Micropterus salmoides</i>		X	X
Black crappie	<i>Pomoxis nigromaculatus</i>	X		X
White crappie	<i>Pomoxis annularis</i>		X	X
Walleye	<i>Stizostedion vitreum</i>			X
Logperch	<i>Percina caprodes</i>			X
Freshwater drum	<i>Aplodinotus grunniens</i>		X	X

\*indicates record from angler survey

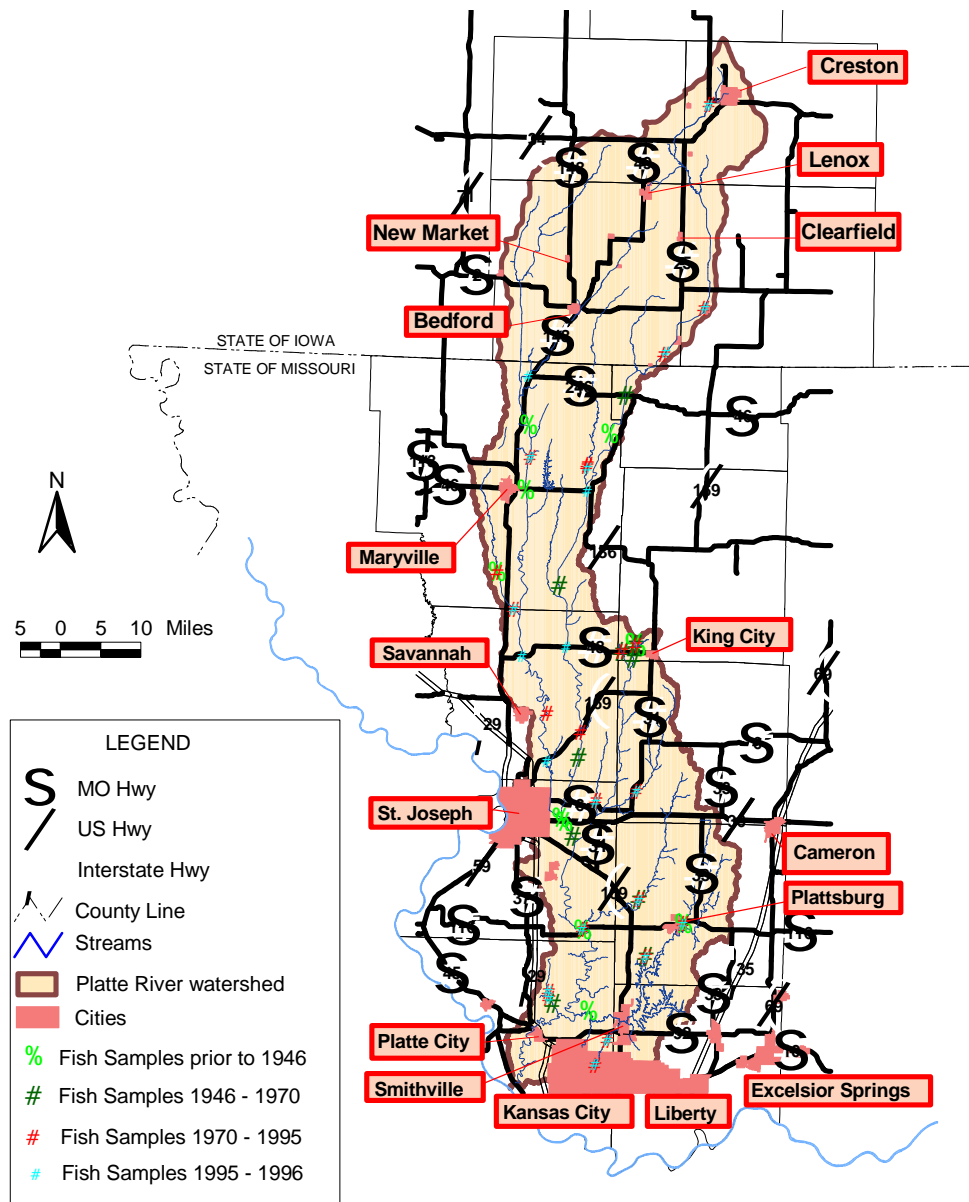


Figure fs. Fish species sampled in the Platte River basin from 1941-1996.

**Table 17. MDC fish and habitat sample locations for the Platte River basin plan from 1995-96.**

<b>Loc. #</b>	<b>Coll. #</b>	<b>Stream Name</b>	<b>Location (T R S)</b>	<b>Date Sampled</b>	<b>Sample Type * K D EF</b>	<b># of Fish Types ** L N B T</b>
<b>1719</b>	<b>TW96-02</b>	<b>Horse Fork</b>	<b>55N-32W-24</b>	<b>07-09-96</b>	<b>X X X</b>	<b>7 9 2 18</b>
<b>1326</b>	<b>TW96-01</b>	<b>Third Fork</b>	<b>61N-33W-24</b>	<b>06-27-96</b>	<b>X X X</b>	<b>4 5 0 9</b>
<b>1377</b>	<b>TW96-03</b>	<b>Castile Creek</b>	<b>55N-33W-01</b>	<b>10-07-96</b>	<b>X X X</b>	<b>9 2 1 12</b>
<b>1378</b>	<b>TW96-04</b>	<b>Roberts Branch</b>	<b>54N-32W-08</b>	<b>07-11-96</b>	<b>X</b>	<b>8 1 0 9</b>
	<b>JA96-01</b>	<b>Jowler Creek</b>	<b>53N-34W-06</b>	<b>09-18-96</b>	<b>X</b>	<b>4 2 0 6</b>
	<b>JA96-02</b>	<b>Jowler Creek</b>	<b>53N-34W-06</b>	<b>09-18-96</b>	<b>X X X</b>	<b>3 3 0 6</b>
	<b>JA96-03</b>	<b>Second Creek</b>	<b>53N-33W-33</b>	<b>09-11-96</b>	<b>X X X</b>	<b>8 6 1 15</b>
	<b>JA96-04</b>	<b>Second Creek</b>	<b>52N-33W-19</b>	<b>09-11-96</b>	<b>X X X</b>	<b>6 7 1 14</b>
<b>946G</b>	<b>B95-145</b>	<b>Platte River</b>	<b>64N-34W-14</b>	<b>10-18-95</b>	<b>X X</b>	<b>2 3 2 7</b>
<b>947G</b>	<b>B95-142</b>	<b>Platte River</b>	<b>61N-34W-27</b>	<b>10-17-95</b>	<b>X X</b>	<b>5 5 1 11</b>
<b>952G</b>	<b>B95-141</b>	<b>102 River</b>	<b>61N-35W-34</b>	<b>10-17-96</b>	<b>X X</b>	<b>4 5 1 10</b>
<b>953G</b>	<b>B95-147</b>	<b>Platte River</b>	<b>55N-34W-26</b>	<b>10-19-95</b>	<b>X X</b>	<b>5 4 0 9</b>
<b>2454G</b>	<b>B95-144</b>	<b>102 River</b>	<b>65N-35W-34</b>	<b>10-18-95</b>	<b>X X</b>	<b>4 5 1 10</b>
	<b>MB96-05</b>	<b>102 River</b>	<b>58N-35W-12</b>	<b>11-04-96</b>	<b>X X X</b>	<b>2 5 2 9</b>
	<b>MB96-06</b>	<b>Muddy Creek</b>	<b>57N-33W-06</b>	<b>11-06-96</b>	<b>X X X</b>	<b>6 7 1 14</b>
	<b>MB96-07</b>	<b>Little Third Fork</b>	<b>58N-33W-36</b>	<b>11-06-96</b>	<b>X X X</b>	<b>3 5 1 9</b>
	<b>MB96-08</b>	<b>Honey Creek</b>	<b>64N-34W-02</b>	<b>11-07-96</b>	<b>X X X</b>	<b>3 3 1 7</b>
	<b>MB96-09</b>	<b>White Cloud Cr.</b>	<b>61N-35W-04</b>	<b>11-08-96</b>	<b>X X X</b>	<b>5 4 1 10</b>
	<b>TOTALS</b>	<b>95-96 Sampling</b>				<b>16 11 3 30</b>

\*K=Kick seining  
D=Drag seining  
EF=Electrofishing

\*\*L=Large fish species  
N=Nektonic fish species  
B=Benthic  
T=Total



**Table 18. Freshwater mussel species found in the Missouri portion of the Platte River basin (Oesch 1984).**

<b>Common Name</b>	<b>Scientific Name</b>	<b>Period Last Collected</b>
<b>Black sandshell</b>	<i>Ligumia recta</i>	Before 1920
<b>Deertoe</b>	<i>Truncilla truncata</i>	Before 1920
<b>Fragile paper shell</b>	<i>Leptodea fragilis</i>	After 1965
<b>Giant floater</b>	<i>Anodonta grandis</i> sp.	Before 1920
<b>Mapleleaf</b>	<i>Quadrula quadrula</i>	Before 1920
<b>Pimpleback</b>	<i>Quadrula pustulosa</i>	Before 1920
<b>Pink heelsplitter</b>	<i>Potamilus alatus</i>	Before 1920
<b>Pink papershell</b>	<i>Potamilus ohioensis</i>	Before 1920
<b>Pistol grip</b>	<i>Tritogonia verrucosa</i>	Before 1920
<b>Rock-pocketbook*</b>	<i>Arcidens confragosus</i>	Before 1920
<b>Squawfoot</b>	<i>Strophitus undulatus</i> sp.	Before 1920
<b>Threeridge</b>	<i>Amblema plicata</i>	After 1965
<b>Threehorn wartyback</b>	<i>Obliquaria reflexa</i>	Before 1920
<b>Washboard</b>	<i>Megaloniaias nervosa</i>	Before 1920
<b>White heelsplitter</b>	<i>Lasmigona complanata</i>	Before 1920
<b>Yellow sandshell</b>	<i>Lampsilis teres</i> ssp.	Before 1920

\* indicates state listing of rare.

**Table 19. Threatened and endangered species in the Missouri portion of the Platte River basin (MDC 1997; USFWS 1996).**

<b>Common Name</b>	<b>Scientific Name</b>	<b>Missouri status</b>	<b>Federal status</b>
<b>Flathead chub</b>	<i>Platygobio gracilis</i>	Endangered	
<b>Topeka shiner</b>	<i>Notropis topeka</i>	Endangered	Candidate
<b>Rock-pocketbook</b>	<i>Arcidens confragosus</i>	Rare	
<b>Henslow's sparrow</b>	<i>Ammodramus henslowii</i>	Rare	
<b>Northern harrier</b>	<i>Circus cyaneus</i>	Endangered	
<b>Bald eagle</b>	<i>Haliaeetus leucocephalus</i>	Endangered	Threatened
<b>Brown bog sedge</b>	<i>Carex buxbaumii</i>	Rare	
<b>Sartwell's sedge</b>	<i>Carex sartwellii</i>	Endangered	
<b>Rock elm</b>	<i>Ulmus thomasii</i>	Rare	

**Table 20. Fish stockings within the Platte River basin, except channel catfish, bluegill, and largemouth bass (MDC files; Mike McGhee IADNR, personal communication).**

<b>Water body</b>	<b>County</b>	<b>Species Stocked</b>
Smithville Lake	Clinton, Clay	Flathead catfish, Black crappie, White crappie, Fathead minnow, Walleye, Tiger muskie ( <i>Esox masquinongy x Esox lucius</i> )*, Blue catfish ( <i>Ictalurus furcatus</i> )*
Nodaway County Community Lake	Nodaway	Gizzard shad, White crappie, Fathead minnow, Northern pike, Tiger muskie*, Grass carp*, Redear sunfish*
Limpp Lake	Gentry	Fathead minnow, Grass carp*, Redear sunfish*
Mozingo Lake	Nodaway	Walleye, Redear sunfish*
Kendzora Lake	Platte	Redear sunfish*
Platte River	Andrew Platte Nodaway	Spotted bass*
Belcher Branch Lake	Buchanan	Fathead minnow, Redear sunfish*
Happy Holler Lake	Andrew	Fathead minnow, Redear sunfish*
Green Valley State Park Lake	Union, IA	Redear sunfish*, Tiger muskie*, Northern pike
Summit Lake	Union, IA	Walleye, Tiger muskie*, Muskellunge ( <i>Esox masquinongy</i> )*, Northern pike
Blockton Lake	Taylor, IA	Flathead catfish, Redear sunfish*, Black crappie
Wilson Co. Park Lake	Taylor, IA	Walleye, Grass carp*
Windmill Lake	Taylor, IA	Walleye
Lake of Three Fires	Taylor, IA	Flathead catfish, White crappie, Black crappie, Tiger muskie*

\*indicates non-native to basin

**Table 21. Estimated fish harvest from Platte River (Agency to confluence with Missouri River) for period of August 31, 1970 to August 29, 1971 (Fleener 1971).**

<b>Species</b>	<b>Upper Section</b>	<b>Lower Section</b>	<b>Total Number</b>	<b>Percent of Total</b>
<b>Common Carp</b>	3,710	10,566	14,276	39.6
<b>Channel catfish</b>	2,346	11,436	13,782	38.3
<b>Flathead catfish</b>	173	5,605	5,778	16.0
<b>Bullhead</b>	0	479	479	1.3
<b>Freshwater drum</b>	0	754	754	2.1
<b>Crappie</b>	0	291	291	0.8
<b>Paddlefish</b>	0	72	72	0.2
<b>American eel</b>	486	0	486	1.4
<b>Largemouth bass</b>	66	0	66	0.2
<b>Buffalo</b>	0	16	16	0.1
<b>Total</b>	6,781	29,219	36,000	100.0